PATENT COOPERATION TREATY

From the INTERNATIONAL BUREAU

PCT

NOTIFICATION OF THE RECORDING OF A CHANGE

(PCT Rule 92bis.1 and Administrative Instructions, Section 422)

To:

STYLE, Kelda, Camilla, Karen
Page White & Farrer
54 Doughty Street
London WC1N 2LS
ROYAUME-UNI

Date of mailing (day/month/year) 16 January 2001 (16.01.01)	
Applicant's or agent's file reference 102407/KCS/JCB	**IMPORTANT NOTIFICATION**
International application No. PCT/EP00/06645	**International filing date** (day/month/year) 12 July 2000 (12.07.00)

1. The following indications appeared on record concerning:

[X] the applicant [X] the inventor [ ] the agent [ ] the common representative

Name and Address	State of Nationality	State of Residence
KORPELA, Sari, K. Forsellesintic 57 E 38 FIN-02700 Kaunlainen Finland	FI	FI
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	Facsimile No.	
	Teleprinter No.	

2. The International Bureau hereby notifies the applicant that the following change has been recorded concerning:

[ ] the person [ ] the name [X] the address [ ] the nationality [ ] the residence

Name and Address	State of Nationality	State of Residence
KORPELA, Sari, K. Bredankuja 7 G 25 FIN-02700 Kaunlainen Finland	FI	FI
	Telephone No.	
	Facsimile No.	
	Teleprinter No.	

3. Further observations, if necessary:

4. A copy of this notification has been sent to:

[X] the receiving Office
[ ] the International Searching Authority
[ ] the International Preliminary Examining Authority
[X] the designated Offices concerned
[ ] the elected Offices concerned
[ ] other:

The International Bureau of WIPO **34, chemin des Colombettes** **1211 Geneva 20, Switzerland**	Authorized officer Catherine Massetti
Facsimile No.: (41-22) 740.14.35	Telephone No.: (41-22) 338.83.38

Form PCT/IB/306 (March 1994) 003774542

PATENT COOPERATION TREATY

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IMPORTANT NOTIFICATION

International application No.
PCT/EP00/06645

International filing date (day/month/year)
12 July 2000 (12.07.00)

1. The following indications appeared on record concerning:

[X] the applicant [X] the inventor [ ] the agent [ ] the common representative

Name and Address
JANSEN, Kaj
Ristikedonkatu 34 as 4
FIN-24240 Salo
Finland

State of Nationality: FI
State of Residence: FI
Telephone No.:
Facsimile No.:
Teleprinter No.:

2. The International Bureau hereby notifies the applicant that the following change has been recorded concerning:

[ ] the person [ ] the name [X] the address [ ] the nationality [ ] the residence

Name and Address
JANSEN, Kaj
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Finland

State of Nationality: FI
State of Residence: FI
Telephone No.:
Facsimile No.:
Teleprinter No.:

3. Further observations, if necessary:

4. A copy of this notification has been sent to:

[X] the receiving Office
[ ] the International Searching Authority
[ ] the International Preliminary Examining Authority
[X] the designated Offices concerned
[ ] the elected Offices concerned
[ ] other:

The International Bureau of WIPO
34, chemin des Colombettes
1211 Geneva 20, Switzerland
Facsimile No.: (41-22) 740.14.35

Authorized officer
Catherine Massetti
Telephone No.: (41-22) 338.83.38

PATENT COOPERATION TREATY

From the INTERNATIONAL BUREAU

PCT

NOTIFICATION OF ELECTION

(PCT Rule 61.2)

To:

Commissioner
US Department of Commerce
United States Patent and Trademark Office, PCT
2011 South Clark Place Room CP2/5C24
Arlington, VA 22202
ETATS-UNIS D'AMERIQUE

in its capacity as elected Office

Date of mailing (day/month/year) 12 March 2001 (12.03.01)	
International application No. PCT/EP00/06645	**Applicant's or agent's file reference** 102407/KCS/JCB
International filing date (day/month/year) 12 July 2000 (12.07.00)	**Priority date** (day/month/year) 14 July 1999 (14.07.99)
Applicant SALONAHO, Oscar et al	

1. The designated Office is hereby notified of its election made:

[X] in the demand filed with the International Preliminary Examining Authority on:

21 January 2001 (21.01.01)

[ ] in a notice effecting later election filed with the International Bureau on:

2. The election [X] was

[ ] was not

made before the expiration of 19 months from the priority date or, where Rule 32 applies, within the time limit under Rule 32.2(b).

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland	Authorized officer Claudio Borton
Facsimile No.: (41-22) 740.14.35	Telephone No.: (41-22) 338.83.38

10/030796

Copy for the Elected Office (EO/US)

PCT/EP00/06645

PATENT COOPERATION TREATY

PCT

NOTIFICATION OF THE RECORDING OF A CHANGE

(PCT Rule 92bis.1 and Administrative Instructions, Section 422)

From the INTERNATIONAL BUREAU

To:

STYLE, Kelda, Camilla, Karen
Page White & Farrer
54 Doughty Street
London WC1N 2LS
ROYAUME-UNI

Date of mailing (day/month/year) 31 January 2002 (31.01.02)	
Applicant's or agent's file reference 102407/KCS/JCB	**IMPORTANT NOTIFICATION**
International application No. PCT/EP00/06645	**International filing date** (day/month/year) 12 July 2000 (12.07.00)

1. The following indications appeared on record concerning:

[X] the applicant [ ] the inventor [ ] the agent [ ] the common representative

Name and Address	State of Nationality	State of Residence
NOKIA NETWORKS OY Keilalahdentie 4 FIN-02150 Espoo Finland	FI	FI
	Telephone No.	
	Facsimile No.	
	Teleprinter No.	

2. The International Bureau hereby notifies the applicant that the following change has been recorded concerning:

[X] the person [ ] the name [ ] the address [ ] the nationality [ ] the residence

Name and Address	State of Nationality	State of Residence
NOKIA CORPORATION Keilalahdentie 4 FIN-02150 Espoo Finland	FI	FI
	Telephone No.	
	Facsimile No.	
	Teleprinter No.	

3. Further observations, if necessary:

4. A copy of this notification has been sent to:

[X] the receiving Office
[ ] the International Searching Authority
[ ] the International Preliminary Examining Authority
[ ] the designated Offices concerned
[X] the elected Offices concerned
[ ] other:

The International Bureau of WIPO **34, chemin des Colombettes** **1211 Geneva 20, Switzerland**	Authorized officer Anne KARKACHI
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Form PCT/IB/306 (March 1994)

004634848

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference	FOR FURTHER ACTION	See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)
102407/KCS/JCB		
International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/EP00/06645	12/07/2000	14/07/1999
International Patent Classification (IPC) or national classification and IPC H04Q7/38		
Applicant NOKIA NETWORKS OY		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 13 sheets, including this cover sheet.

   ☐ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

   These annexes consist of a total of sheets.

3. This report contains indications relating to the following items:

   - I ☒ Basis of the report
   - II ☐ Priority
   - III ☒ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
   - IV ☐ Lack of unity of invention
   - V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations suporting such statement
   - VI ☐ Certain documents cited
   - VII ☒ Certain defects in the international application
   - VIII ☒ Certain observations on the international application

Date of submission of the demand	Date of completion of this report
22/01/2001	16.10.2001
Name and mailing address of the international preliminary examining authority: European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized officer Jaskolski, J Telephone No. +49 89 2399 7567

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/EP00/06645

I. Basis of the report

1. With regard to the **elements** of the international application *(Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17))*:
Description, pages:

1-13 as originally filed

Claims, No.:

1-29 as originally filed

Drawings, sheets:

1/2-2/2 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
- ☐ the claims, Nos.:

☐ the drawings, sheets:

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

III. Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

1. The questions whether the claimed invention appears to be novel, to involve an inventive step (to be non-obvious), or to be industrially applicable have not been examined in respect of:

☐ the entire international application.

☒ claims Nos. 7,9.

because:

☐ the said international application, or the said claims Nos. relate to the following subject matter which does not require an international preliminary examination (*specify*):

☒ the description, claims or drawings (*indicate particular elements below*) or said claims Nos. are so unclear that no meaningful opinion could be formed (*specify*):
see separate sheet

☐ the claims, or said claims Nos. are so inadequately supported by the description that no meaningful opinion could be formed.

☐ no international search report has been established for the said claims Nos. .

2. A meaningful international preliminary examination cannot be carried out due to the failure of the nucleotide and/or amino acid sequence listing to comply with the standard provided for in Annex C of the Administrative Instructions:

☐ the written form has not been furnished or does not comply with the standard.

☐ the computer readable form has not been furnished or does not comply with the standard.

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N) Yes: Claims 11

	No:	Claims	1,2-6,12-16,18,20,22,25-29
Inventive step (IS)	Yes:	Claims	11
	No:	Claims	8,10,17,19,21,23,24
Industrial applicability (IA)	Yes:	Claims	1-29
	No:	Claims	

2. Citations and explanations
see separate sheet

VII. Certain defects in the international application

The following defects in the form or contents of the international application have been noted:
see separate sheet

VIII. Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:
see separate sheet

Reference is made to the following documents:

D1: US-A-5 241 686 (CHARBONNIER ALAIN) 31 August 1993 (1993-08-31)
D2: US-A-5 640 677 (KARLSSON BROR ANGSTROM KE) 17 June 1997 (1997- 06-17)

Re Item III

1. Dependent **claims 7 and 9** comprise a term "the neighbouring cell" and it is unclear (Article 6 PCT), whenever this term refers to the features "current cell" or "at least one other cell" of preceding claims, or yet another feature "neighbouring cell" attempts to be defined. In this latter case it is unclear in which sense, and to which other features of the claims, the neighbouring cell is a neighbour.
Due to this unclarity no opinion on claims 7 and 9 has been formulated.

Re Item V

1. The subject-matter of **claim 1** is not new in the sense of Articles 33(1) and (2) PCT. Document D2 discloses all the features of this claim (references in parentheses applying to this document):

a method for selecting a new cell for a station in a cellular telecommunication system (col. 2, line 66 - col. 3, line 55), said station being associated with a current cell (col. 2, lines 66-67: a mobile station is served by the base station), said method comprising the steps of:
measuring at the station the strength of a communication from said current cell (col. 3, lines 14-18: the signal strength of the radio signals between the mobile station and the base station is measured; and col. 8, lines 24-26: the signal strength measured by the mobile station);
measuring at the station the strength of a communication from at least one other cell (col. 3 lines 35-39: the signal strength of the radio signal broadcast by a second base station on the second radio channel is

measured);
modifying the result of the measuring step in which the strength of the communication from at least one other cell and/or the current cell is measured to take into account a condition of said current and/or said at least one other cell if the measured strength of the communication from the current cell and/or the measured strength of the communication from the at least one other cell satisfy a predetermined condition (col. 3 lines 18-22 : whether or not to handoff the mobile to a base station serving an associated cell is determined based upon whether the signal strength of the radio signal therefrom is greater than the threshold value and on the preference assigned to the associated cell; col. 7 lines 2-8: a signal offset value is substracted from the measured cell signal strength before comparison to candidate cell signal strength);
if the modifying step is performed, comparing the measured strength of said communication from the current cell and the measured strength of the communication from the at least one other cell, at least one of the measured strengths being modified in the modifying step (col. 3 lines 18-22 and col. 7 lines 2-8, see previous indication); and
depending of the results of the comparison, changing the current cell with which the station is associated (col. 3 lines 18-22: handoff the mobile to a base station serving an associated cell).

The subject-matter of claim 1 is therefore not new in the sense of Article 33(1) and (2) PCT.

2. The subject-matter of independent **claim 29** differs from the subject-matter of claim 1 only in that "changing at least one current cell" is performed in claim 29 instead of "selecting a new cell" in claim 1 (see conciseness and clarity objection to claim 29 in Section VIII). These terms equally correspond to a term "handover" of the document D2.
Therefore, in view of the disclosure provided by the document D2 in relation to the subject-matter of claim 1 (see preceding paragraph), the subject-matter of claim 29 is not novel in the sense of Article 33(1) and (2) PCT.

3. The subject-matter of independent **claim 22** discloses a station for use with a method of claim 1, the station having all the features corresponding to the method features of claim 1. Therefore, in view of the disclosure provided by the document D2 in relation to claim 1 (reference is made to paragraph 1), the subject-matter of claim 22 is not novel in the sense of Articles 33(1) and (2) PCT.

4. The subject-matter of independent **claim 23** discloses a cellular telecommunications network comprising at least one station as claimed in claim 22 and at least one other station, the at least one another station requiring a different procedure in order to determine if a new current cell is required (thus a handoff procedure). It is clear for a skilled person that such an other station could be any state-of-the-art mobile station using different handoff procedure, and because the mobile station as claimed in claim 22 is known (reference is made to paragraph 3), and this station can coexist with other state-of-the-art mobile stations, the coexistence of both stations in a cellular telecommunications network can be easily perceived. Therefore the subject-matter of claim 23 does not involve an inventive step in the sense of Articles 33(1) and (3) PCT.

5. The subject-matter of independent **claim 25** is not new in the sense of Article 33(1) and (2) PCT. Document D2 discloses all the features of this claim (references in parentheses applying to this document):

a network element in a telecommunications system for sending communications to a station associated with a current cell network element being associated with a cell (col. 12 lines 24-30: the control unit of the base station or the central processor of the MSC process the information), said network element being arranged to send information to said station (col. 10 line 66 - col. 11 line 2: all control channels are continuously and cyclically broadcasting neighbour cell information which is valid for the cell within which the mobile is currently located), said information being used by said station to modify measurements of the strength of communications from at least the other cell (col. 11, lines 2-22: the neighbour cell information

consists of (...) 3) a signal strength threshold for each preferred neighbour, 4) for each cell a signal strength threshold, 5) for all neighbours a hysteresis value; and col. 11 lines 50-54: another way to provide the mobile with the neighbour types, the threshold and the hysteresis would be to broadcast them).

The subject-matter of the independent claim 25 is therefore not new.

6. The subject-matter of independent **claim 26** is not new in the sense of Article 33(1) and (2) PCT. Document D2 discloses all the features of this claim (references in parentheses applying to this document):

a network element in a telecommunication system for sending communications to a station associated with a current cell (col. 12 lines 24-30: the control unit of the base station or the central processor of the MSC process the information) network element being associated with a cell (col. 12 lines 24-30: see previous indication), said network element being arranged to send information to said station (col. 10 line 66 - col. 11 line 2: all control channels are continuously and cyclically broadcasting neighbour cell information which is valid for the cell within which the mobile is currently located), wherein said information comprises information defining a threshold (col. 11 lines 9-22: a signal strength threshold), wherein said station is arranged to modify measurements of the received strength of communications from at least one other cell (col. 8, lines 50-51: a hysteresis value will be applied to the threshold) if the measurements exceed said threshold (col. 11, lines 25-35: the mobile tunes to a neighbour as soon as the measured signal strength for this neighbour is above the threshold).

The subject-matter of the independent claim 26 is therefore not new.

7. Dependent **claims 2-6, 12-16, 18, 20, 27, 28** do not appear to contain any additional features which, in combination with the features of any claim to which they refer, meet the requirements of the EPC with respect to novelty

(Article 33(1) and (2) PCT).
Document D2 discloses all the features of the respective claims (references in parentheses applying to this document):

a) **claim 2**: in modifying step a value is added to the result of the measuring step in which the strength of a communication from the at least one other cell is measured (col. 7 lines 24-26: adding a plus or minus 5 db inaccuracy and a +- 3 db hysteresis; col. 8 lines 50-52: a hysteresis value will be applied to the threshold),

b) **claim 3**: in modifying step a function is applied to the result of the measuring step in which the strength of a communication from the at least one other cell is measured (col. 3 lines 41-55: conditions a)-c) and col. 4 lines 3-7: choosing the cell having both the smallest service area and a radio signal strength at least equal to the minimum acceptable value),

c) **claim 4**: predetermined condition is that the strength of the communication from at least one other cell is greater than a threshold (col. 3 lines 41-46: the second base station is selected if the signal strength of the radio signal of the second radio channel being greater than a preselected value),

d) **claim 5**: threshold is defined relative to the strength of the communication from the current cell (col. 8, lines 15-20: present algorithm functions adequately to use relative signal strength between current cell and neighbouring cells in order to locate handoff borders),

e) **claim 6**: information defining said threshold is included in the communication from the current cell (col. 10 line 66 - col. 11 line 2: all control channels are continuously and cyclically broadcasting neighbour cell information which is valid for the cell within which the mobile is currently located; and col. 11, lines 9-20: signal strength threshold value for each neighbour)

f) **claim 12**: a value is added to the measured strength of the communication from the current cell prior to the comparing step (col. 8 lines 50-52: a hysteresis value will be applied to the threshold),

g) **claim 13**: the functionality of applying the same operations to a new cell, when the new cell becomes a current cell, and all the functionality related to the "old current cell" apply to the "new current cell" is a clear effect of the method disclosed in the document D2 in relation to the preceding claims,

h) **claim 14**: communication comprises the broadcast control channel (col. col. 10 lines 3-15: the control channel of the base station is used for communication with mobile stations),

i) **claim 15**: one or more common channels in a cell (col. 5 lines 38-43 and col. 10 lines 3-15),

j) **claim 16**: dedicated channel in a cell (col. 10 lines 8-15),

k) **claim 18**: the station is a mobile terminal (col. 2 line 66: a mobile station),

l) **claim 20**: telecommunication system is a TDMA system (col. 1, lines 39-40: TDMA),

j) features of **claims 27 and 28** are disclosed in the document D2 in col. 12 lines 24-27, in col. 3 lines 23-64, in col.9 lines 45-58 and in col. 11 lines 2-22.

4. Dependent **claims 8, 10, 17, 19, 21, 24** do not contain any features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT in respect of inventive step, the reasons being as follows:

a) The feature of **claim 8** that the station is provided with timing information defining when the station should next check for the modifying information, is a well known feature of control channel monitoring in mobile telecommunication systems. According to the disclosure of D2 the modifying information is broadcasted on a control channel (see passages of D2 indicated in relation to claim 1), and providing the mobile station with timing information defining when the station should next check for the information broadcasted on a control channel is an obvious requirement of control channel monitoring techniques in mobile telecommunication systems.

b) The feature of **claim 10** to perform measurements and compare results for a predetermined period of time before the cell change is executed, can be perceived by a skilled person as a known requirement of performing measurements, for example a similar approach is applied to a handover method disclosed in the document D1 in col. 9 lines 53-59: "the values of load indicator and correction parameter are sampled periodically, and are used to analyse the traffic".

c) The feature of **claim 17,** that the station is arranged to use the same frequency in the current cell and in the at least one other cell, is one of the several straightforward possibilities known in the field of telecommunications from which a skilled person would select in order to solve the problem of frequency arrangements in cells.

d) The features of **claims 19 and 21** are foreseen in the document D2 in the hint in col. 13 lines 36-40. It would be therefore obvious for a skilled person to follow the hint, and thus to apply the disclosure of D2 to other types of telecommunication systems, arriving at the features of claims 19 and 21.

e) The features of **claim 24** belong to explicit requirements of operation of telecommunication systems. It is clear that different procedures based on different parameters require different signalling corresponding to these

procedures.

5. The additional features of dependent **claim 11** are neither known nor rendered obvious from the prior art documents. These features could therefore, in combination with features of claims to which claim 11 refers, serve as a basis to establish novelty and inventive step requirements in the sense of Article 33 PCT.

Re Item VII

1. A part of the description on page 2, corresponding to claim 1, refers to an ambiguous term "station" (see also Section VIII paragraph 1) which is unclear (Articles 5 and 6 PCT).

2. Contrary to the requirements of Rule 5.1(a)(ii) PCT, the relevant background art disclosed in the document D2 is not mentioned in the description, nor is this document identified therein.

3. Independent claims are not in the two-part form in accordance with Rule 6.3(b) PCT, which in the present case would be appropriate, with those features known from the prior art document D2 being placed in the preamble (Rule 6.3(b)(i) PCT) and with the remaining features being included in the characterising part (Rule 6.3(b)(ii) PCT).

4. The features of the claims are not provided with reference signs placed in parentheses (Rule 6.2(b) PCT).

Re Item VIII

1. **Claims 1, 8, 15, 16, 17, 21-26 and 29** do not meet the requirements of Article 6 PCT in that the matter for which protection is sought is not clearly defined. The claims refer to a feature "station", which can be interpreted with help of the description as a "base station" or a "mobile station". This ambiguity does not allow to determine the scope of protection sought.

For the purpose of examination in Section V it has been assumed that the term "station" relates to the mobile station, according to claim 18. Otherwise, expressions like "selecting a new cell for a station", or "changing the current cell" linked to a base station, are unclear.

2. **Claims 1 and 29** are not concise (Article 6 PCT). Said claims differ only in the wording: "selecting a new cell" in claim 1 and "changing at least one current cell" in claim 29. Both terms equally correspond to a handover process in mobile telecommunication networks. Therefore both claims relate to the same subject-matter, and thus introduce a repetition of the subject-matter, which is not concise (Article 6 PCT).
Moreover as the only one cell change is performed in the method of claim 29, the expressions "at least one" in relation to cells in this claim are unclear (Article 6 PCT). It is not clear from the wording of claim 29 if the intention was to introduce a greater number of cells involved or not.

3. As indicated in Section III, **claims 7 and 9** are unclear in respect to the term "the neighbouring cell".

4. Claim 20 is dependent on claim 19 while features of **claims 19 and 20** are mutually exclusive. The dependence of claim 20 on claim 19 is therefore unclear (Article 6 PCT).

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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(72) Inventors; and

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(74) Agents: **STYLE, Kelda, Camilla, Karen** et al.; Page White & Farrer, 54 Doughty Street, London WC1N 2LS (GB).

(81) Designated States *(national)*: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW.

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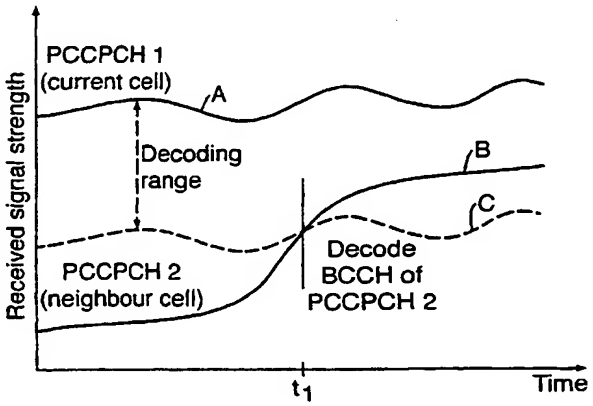
(54) Title: A METHOD OF SELECTING A NEW CELL



(57) Abstract: A method for selecting a new cell for a station in a cellular telecommunications system, the station being associated with a current cell is provided. The method comprises the steps of measuring at the station the strength of a communication from the current cell, measuring at the station the strength of a communication from at least one other cell, modifying the result of the measuring step in which the strength of the communication from at least one other cell and/or the current cell is measured to take into account a condition of the current and/or said at least one other cell if the measured strength of the communication from the current cell and/or the measured strength of the communication from the at least one other cell satisfy a predetermined condition, if the modifying step is performed, comparing the measured strength of the communication from the current cell and the measured strength of the communication from the at least one other cell at least one of the measured strengths being modified in the modifying step and depending on the results of the comparison changing the current cell with which the station is associated.

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For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

A METHOD OF SELECTING A NEW CELL

FIELD OF THE INVENTION

The present invention relates to a method for selecting a new cell.

BACKGROUND TO THE INVENTION

In a wireless cellular telecommunications network, the area covered by the network is divided into an plurality of cells. Each cell is provided with a base station which is able to communicate with mobile stations located in the cell associated with the base station. The mobile stations are able to move from cell to cell. When a mobile station moves from one cell to another, this is referred to as handoff. In this document, the term cell will be used to refer to cells and/or cell sectors.

In current systems, the mobile station is arranged to monitor channels from a number of base stations in the cells neighbouring the cell in which the mobile station is currently located. The mobile station measures the received strength of the signals from the surrounding base stations. Based on this information a decision is made as to whether the current cell is to be changed and if so to which cell. However this method has the disadvantage of not receiving any information relating to, for example, traffic conditions in the neighbouring cells. This means that the mobile station's decision will be based solely on the magnitude of the received signals. Accordingly, the mobile station will not always make the appropriate decision.

A common channel of the neighbouring cell could be continuously monitored and decoded by a mobile station in a different cell in order to obtain information on an adjacent cell. However, this is disadvantageous if a mobile station is in an idle state as it will consume power reducing the battery life. This channel could be the broadcast control channel BCCH.

SUMMARY OF THE INVENTION

It is an aim of embodiments of the present invention to address the disadvantage with the prior art.

According to one aspect of the present invention there is provided a method for selecting a new cell for a station in a cellular telecommunications system, said station being associated with a current cell, said method comprising the steps of measuring at the station the strength of a communication from said current cell; measuring at the station the strength of a communication from at least one other cell; modifying the result of the measuring step in which the strength of the communication from at least one other cell and/or the current cell is measured to take into account a condition of said current and/or said at least one other cell if the measured strength of the communication from the current cell and/or the measured strength of the communication from the at least one other cell satisfy a predetermined condition; if the modifying step is performed, comparing the measured strength of said communication from the current cell and the measured strength of the communication from the at least one other cell, at least one of the measured strengths being modified in the modifying step; and depending of the results of the comparison, changing the current cell with which the station is associated.

According to a second aspect of the present invention there is provided a station for use in a cellular telecommunications system, said station being associated with a current cell, said station comprising means for measuring the received strength of a communication from said current cell; means for measuring the received strength of a communication from at least one other cell; means for modifying the measured received strength of the communication from the at least one other cell to take into account a condition of said current and/or said at least one other cell if the measured strength of the communication from the current cell and/or the measured strength of the communication

from the at least one other cell satisfy a predetermined condition; means for comparing if the modification means modifies the measured received strength of the communication from the at least one other cell, the modified result with the measured received strength of a communication from the current cell; and means for causing, depending of the results of the comparison performed by the comparing means, the current cell with which the station is associated to be changed.

BRIEF DESCRIPTION OF THE DRAWINGS

For a better understanding of the present invention and as to how the same may be carried into effect, reference will now be made by way of example to the accompanying drawings in which:
Figure 1 shows a schematic view of a cellular telecommunications network in which embodiments of the present invention can be implemented;
Figure 2 shows a graph of signal strength against time for the physical channels received by a mobile station;
Figure 3 shows a graph of signal strength against time for the physical channels received by a mobile station, where the signal received from a neighbouring base station has been compensated; and
Figure 4 shows a graph of signal strength against time for the physical channels where a compensation value and hysteresis have been applied.

DETAILED DESCRIPTION OF EMBODIMENTS OF THE PRESENT INVENTION

Reference will now be made to Figure 1 which shows a wireless cellular telecommunication network. The area 2 covered by the network is divided up into cells 4a-g. Each cell 4 has a base station 6 associated therewith which transmits signals to and receives signals from mobile stations 8 which are located in the cell 4 associated with the respective base station 6.

The network shown in Figure 1 is a code division multiple access

system. This means that the same frequency can be used in adjacent cells. The channels between the mobile station and the base stations are distinguished by their spreading codes with different channels using different spreading codes. In the embodiment described hereinafter, it is assumed that the frequency used in the cells is the same.

Consider cell 4a of Figure 1. This cell is surrounded by six neighbouring cells. A mobile station 10 is in the cell 4a which will be referred to as the current cell of that mobile station. The mobile station will receive on various channels from the base station and likewise will send on various channels to the base station. The number and type of channels will depend on the mode of the mobile station. For example if the mobile station is in an idle mode where the mobile station is turned on but which is not engaged in a call, the number of channels will be relatively small.

Embodiments of the present invention can be used when a mobile station is an idle mode or in a radio resource control (RRC) mode where the mobile station is in communication with the base station using common channels. Common channels are ones which are used by more than one mobile station to transmit to the base station or which are used by the base station to transmit to more than one mobile station. Embodiments of the present invention can also be used if one or more dedicated channels have been established.

The mobile station will monitor the broadcast control channel (BCCH) transmitted by the base station of the current cell. In addition to using the information contained in the channel, the mobile station will also measure the strength with which that channel is received by the mobile station. The information contained in the BCCH channel contains information which is required by the mobile station in order to establish a connection with the base station. This information may include random access parameters, system information, frame numbers and the like. The

BCCH channel may act as a pilot channel.

In embodiments of the present invention, the BCCH will include information defining a decoding range threshold. The function of the decoding range threshold will be described in more detail hereinafter.

The mobile station 10 is also arranged to measure the received strength of the BCCH channels transmitted by one or more of the neighbouring cells. These measurements may be made continuously or may only be made when it is determined that the received signal strength of the BCCH channel from the base station of the current cell is below a signal strength threshold. Information on this threshold may be transmitted to the mobile station from the base station of the current cell on the BCCH channel or any other suitable channel. Alternatively, this threshold may be determined by the mobile station based on the history of received signal strengths. This threshold may be defined as a percentage of a measured maximum value or may be an absolute value. This threshold is optional and can be omitted.

The mobile station uses a decoding range threshold to determine which of the received BCCH signals from neighbouring base stations are to be decoded. This is illustrated in Figure 2. Line A shows the strength with which the BCCH channel is received by the mobile station from the base station of the current cell against time. Line B shows the strength with which the BCCH channel transmitted by a neighbouring base station is received against time. Line C shows the decoding threshold. As can be seen this threshold is defined as being a fixed number of decibels below the strength of the signal received from the base station of the current cell. The threshold thus varies over time in the same manner as the received strength of the signal from the base station of the current cell. When the received strength of the signal received from one or more base stations in neighbouring cells exceeds the threshold, the information contained in the BCCH channel transmitted by the neighbouring cell is decoded. In

the example shown in Figure 2, after time t1, the received strength of the signal from the neighbouring cell is above the threshold and is thus decoded.

In an alternative embodiment of the present invention, the decoding relative threshold may be replaced by an absolute threshold. In a further modification to embodiments of the invention, the decoding relative threshold is not provided and all of the BCCH channel signals received from neighbouring cells are decoded.

The BCCH channel received from the neighbouring cell is decoded in order to obtain offset information. This offset information can take the form of an absolute value, a percentage value or any other form. This value may reflect the traffic conditions in the neighbouring cells. For example, if there is a large amount of traffic in the neighbouring cell, then the offset value will reflect this. The offset value may additionally or alternatively indicate if the user of the mobile station is permitted to operate in the neighbouring cell. In this latter case, the offset value may be a weighting value. The offset value may also be indicative of the strength at which the BCCH channel is transmitted by the base station in the neighbouring cell. For example, if the BCCH is transmitted with a relatively low power, then the offset value may be relatively large. On the other hand, if the signal is transmitted with a relatively high power, then the offset value may be relatively small or even negative.

The offset value can be positive, negative or zero.

The offset value is added to the received strength of the signal in the neighbouring cell. This offset value is relatively static and changes only slowly with time in preferred embodiments of the present invention. In alternative embodiments of the present invention the offset value may change relatively frequently depending on what is represented by that offset value.

In general terms, the offset value is representative of the ability of the neighbouring cell to accept the mobile station. This may reflect the traffic conditions in the neighbouring cell which may or may not take into account the traffic conditions in the current cell. Alternatively or additionally the offset value may reflect whether or not the mobile station is permitted to enter the cell or may be such as to discourage/encourage the mobile station to use the neighbouring cell.

The offset value may be alternatively or additionally be a value which is subtracted from, multiplied with or divided into the received signal strength of the signal from the neighbouring cell. In an alternative embodiment of the invention, the offset value may be replaced by an offset function which modifies the received signal strength value in accordance with that function.

In preferred embodiments of the present invention, the offset value and the decoding range are of similar or the same magnitude.

Reference is made to Figure 3 which shows a curve B of Figure 2. Curve D represents the strength of the received signal from the neighbouring cell to which the offset value has been added. The graph also shows curve A of Figure 2 which represents the strength of the received signal from the base station of the current cell. When the compensated value of the strength of the received signal exceeds that of the of the received strength of the signal from the current cell, the mobile station is allocated to the neighbouring cell and that neighbouring cell then becomes the current cell.

It should be appreciated that the received signal strength for the current cell can also be modified by an offset value. This offset value is obtained from the BCCH channel transmitted by the base station of the current cell. This may be as an alternative to the modification of the received strength of the signal from the base station in the neighbouring cell. However in preferred

embodiments of the present invention both the received strength of the signal from the neighbouring cell as well as the received strength of the signal from the current cell are modified by respective offset values.

In a preferred embodiment of the invention, a timer is used. This timer is arranged to ensure that the current cell is only changed when necessary. In particular the changing of the current cell only takes place if the modified received strengths of the signals from the neighbouring cells exceeds the received strengths of the signals from the current cell (which may or may not be modified by the offset value) for a predetermined time. As can be seen from Figure 3, the modified received strength of the signal from the neighbouring base station exceeds the received strength of the signal from the current base station at time t2. However, the current cell is not changed until time t3 which is after time t2. From time t2 to time t3 (time T), the modified received signal strength of the neighbouring cell exceeds the received signal strength of the current cell. If this occurs, then the neighbouring cell becomes the current cell.

If the modified received signal strength of neighbouring cell does not exceed the received signal strength of the current cell for a time T, then the current cell is not changed.

The time T may be a fixed time or may vary. If T varies, this could take into account the environment and/or the traffic. Information as to the value of T may be included in the BCCH channel of the current base station and/or the neighbouring base station.

Where embodiment of the invention are utilised in a system where the frequency used in the neighbouring cell is the same as in the current cell, the time T should be relatively short in order to minimise interference effects.

It should be appreciated that embodiments of the present

invention can be used in soft handoff situations. Handoff is where a mobile station moves from one cell into another and therefore changes the base station with which it is in communication. Soft handoff occurs usually, but not necessarily, where a mobile station is in the border region of two or more cells. In soft handoff, the mobile station will be in active communication with two or more base stations at the same time and will combine the information received from the different base stations. The mobile station receives the same information from more than one base station.

Embodiments of the invention can be used to make decisions as to when to go into soft handoff and when to just communicate with a single base station. For example when the strength of the signal received from the neighbouring base station exceeds that of the current base station, then the mobile station could go into soft handoff where it communicates actively with the base stations of the current and the neighbouring cells. The mobile station may just communicate with the base station of the neighbouring cell when the difference between the received signal strengths exceeds a threshold. Alternatively the offset value(s) used to compensate the received signal strengths of the neighbouring and/or current cells is altered so that the compensated received strength of the signal from the neighbouring cell is less than the received strength of the signal from the current cell. The next time that the compensated strength of the signal received from the neighbouring cells is greater than that for the current cell, the mobile station only actively communicates with the base station of the neighbouring cell which then becomes the current cell.

An offset timer may be used in the above described embodiments. This timer indicates to the mobile station how often the mobile station should update its offset value. The mobile station will not decode again the BCCH channel from the base station of the neighbouring cell until the time defined by the timer has expired. This is regardless of whether or not the signal received from the neighbouring cell is above the threshold discussed in

relation to Figure 2. When the timer has expired, the next time that the strength of the signal received from the neighbouring cells exceeds the threshold, the BCCH channel of the neighbouring base station is decoded to obtain the offset value.

The timer may be predefined or may vary with time. In the latter case, the timer may take into account the current traffic conditions and/or the radio environment. The value of the timer may be included in the BCCH channel of the current base station or the neighbouring base station.

It is preferred that the timer be relatively long so as not to decrease the standby time when the mobile station is not in use.

A further modification to the system and method described herein before will now be described with reference to Figure 4 which illustrates the use of hysteresis. Figure 4 shows curves A, B and D of Figure 3. These curves are the same as described hereinbefore and accordingly will not be described in any more detail hereinafter. Hysteresis is used to avoid excessive changes in the current cell identity. The hysteresis value may be broadcast on the BCCH channel of the current cell or that of the neighbouring cell. Alternatively the hysteresis value may be prestored in the mobile station.

The mobile station adds the hysteresis value to the received signal strength values for the current cell. This hysteresis value may be in addition or instead of an offset value which is added to the results of the received signal strength measurement for the current cell. This is represented by curve E of Figure 4. This summed value is compared to the offset adjusted received signal strength for the neighbouring cell. If the latter value exceeds the former then the mobile station will change its current cell to the neighbouring cell. The hysteresis value may be relatively small in order to minimise interference effects.

The hysteresis value may only be added to the value of the

measured signal strength for the current cell. If the current cell is no longer the current cell, then the hysteresis value will no longer be added to the measured signal strength of the old current cell. Instead the same or a different hysteresis value will be added to the measured signal strength for the new current cell.

The hysteresis value is provided in order to prevent ping-pong selections of the new and old current cells.

In embodiments of the invention described hereinbefore, the mobile station monitored the BCCH channel. It should be appreciated that in alternative embodiments of the present invention, the mobile station can monitor any other suitable channel or channels. The monitored channels in the current and neighbouring cells may be the same or different. Required information may be obtained from different channels of the same base station. Embodiments of the invention have been described in the context of the cell reselection where the mobile station is an idle or the like mode where the mobile station is in communication only via one or more common channels with the base station. However embodiments of the present invention are also applicable to handover situations. This is where the mobile station has one or more dedicated channels established with the base station of the current cell and the base station of a neighbouring cell becomes the one which is in active communication with the mobile station.

It should be appreciated, that it is possible to transmit one or more of the values described hereinbefore to the mobile station using a dedicated channel, particularly but not necessarily if that channel has already been established.

In a system embodying the present invention, only some of the mobile stations may be able to implement the present invention. Accordingly, the network may require signalling to determine if a given mobile station is capable of implementing the embodiments

of the invention. Those mobile stations which are capable of implementing embodiments of the invention will do so. However, those mobile stations which are not able to do so will use an alternative method. This may means that measurements made by the mobile station are used by a base station or other network element to make the required decisions. Alternatively, the mobile station may use a different strategy to identify new current cells.

Embodiments of the present invention have been described in the context of a system where the same frequency is used in adjacent cells. Embodiments of the present invention can be used in systems where a number of frequencies are used in each cell, with at least some of the same frequencies being used in adjacent cells. In this case, the mobile station may monitor the same frequency in the adjacent cell to that which is currently being used by the mobile station. Alternatively, the mobile station may monitor a different frequency to that of the current cell.

Embodiments of the present invention can also be used where the frequency used in adjacent cells is always different from that used in the cell where the mobile station is currently located.

In embodiments of the present invention, the same frequency can be used by the mobile station and the base station transmissions. Alternatively different frequencies can be used by the mobile station and base station transmissions. The frequency used can have a wide range or a narrow range.

Embodiments of the invention can be used where there is more than one neighbour cell and there is therefore more than one communication from the neighbouring cells which is measured and to which offset values are applied.

The mobile station may be mobile telephone, a portable computer or any other suitable device. Embodiments of the invention may be used with fixed terminals if for example the borders of a cell

change depending on the amount of traffic in the cells.

Whilst embodiments of the present invention have been described in the context of a CDMA system, it should be appreciated that embodiments of the present invention can also be used with any other suitable system such a other types of spread spectrum system, time division multiple access systems, frequency division multiple access systems and hybrids of any one or more of these systems.

CLAIMS

1. A method for selecting a new cell for a station in a cellular telecommunications system, said station being associated with a current cell, said method comprising the steps of:

measuring at the station the strength of a communication from said current cell;

measuring at the station the strength of a communication from at least one other cell;

modifying the result of the measuring step in which the strength of the communication from at least one other cell and/or the current cell is measured to take into account a condition of said current and/or said at least one other cell if the measured strength of the communication from the current cell and/or the measured strength of the communication from the at least one other cell satisfy a predetermined condition;

if the modifying step is performed, comparing the measured strength of said communication from the current cell and the measured strength of the communication from the at least one other cell, at least one of the measured strengths being modified in the modifying step; and

depending of the results of the comparison, changing the current cell with which the station is associated.

2. A method as claimed in claim 1, wherein in said modifying step, a value is added to the result of the measuring step in which the strength of a communication from the at least one other cell is measured.

3. A method as claimed in claim 1, wherein in said modifying step, a function is applied to the result of the measuring step in which the strength of a communication from the at least one other cell is measured.

4. A method as claimed in any preceding claim, wherein said predetermined condition is that the strength of the communication from at least one other cell is greater than a threshold.

5. A method as claimed in claimed in claim 4, wherein said threshold is defined relative to the strength of the communication from the current cell.

6. A method as claimed in claim 4 or 5, wherein information defining said threshold is included in the communication from the current cell.

7. A method as claimed in any preceding claim, wherein modifying information as to how the measured strength of the communication from the neighbouring cell is to be modified is in the communication from the at least one other cell.

8. A method as claimed in claim 7, wherein the station is provided with timing information defining when the station should next check for said modifying information.

9. A method as claimed in claim 8, wherein said timing information is in the communication from the neighbouring cell.

10. A method as claimed in any preceding claim, wherein the current cell is changed only if the results of the comparison are such that the modified results exceed the measured strength of the communication from the current cell for a predetermined period of time.

11. A method as claimed in claim 10, wherein information defining the predetermined period of time is in the communication from said current cell.

12. A method as claimed in any preceding claim, wherein a value is added to the measured strength of the communication from the current cell prior to the comparing step.

13. A method as claimed in claim 12, wherein if the current cell is changed, said value is no longer added to the measured strength of the communication from the old current cell and a

value is added to the measured strength of the communication from the new current cell.

14. A method as claimed in any preceding claim, wherein said communication from at least one of said current cell and the at least one other cell comprises the broadcast control channel.

15. A method as claimed in any one of the preceding claims, wherein said station has only one or more common channels in said current cell.

16. A method as claimed in any one of claims 1 to 14, wherein said station has at least one dedicated channel in said current cell.

17. A method as claimed in any preceding claim, wherein the station is arranged to use the same frequency in the current cell and the at least one other cell.

18. A method as claimed in any preceding claim, wherein said station is a mobile terminal.

19. A method as claimed in any preceding claim, wherein said telecommunication system is a code division multiple access system.

20. A method as claimed in any preceding claim, wherein said telecommunication system is a time division multiple access system.

21. A method as claimed in claim 19 and 20, wherein said telecommunication system is a code division/time division multiple access hybrid.

22. A station for use in a cellular telecommunications system, said station being associated with a current cell, said station comprising:

means for measuring the received strength of a communication from said current cell;

means for measuring the received strength of a communication from at least one other cell;

means for modifying the measured received strength of the communication from the at least one other cell to take into account a condition of said current and/or said at least one other cell if the measured strength of the communication from the current cell and/or the measured strength of the communication from the at least one other cell satisfy a predetermined condition;

means for comparing if the modification means modifies the measured received strength of the communication from the at least one other cell, the modified result with the measured received strength of a communication from the current cell; and

means for causing, depending of the results of the comparison performed by the comparing means, the current cell with which the station is associated to be changed.

23. A cellular telecommunications network comprising:

at least one station as claimed in claim 22, and at least one other station, said at least one other station requiring a different procedure in order to determine if a new current cell is required.

24. A network as claimed in claim 23, wherein the signalling sent by said network to said at least one station and to said at least one other station is dependent on the procedure required by the respective stations to determine if a new current cell is required.

25. A network element in a telecommunications system for sending communications to a station associated with a current cell network element being associated with a cell, said network element being arranged to send information to said station, said information being used by said station to modify measurements of the strength of communications from at least one other cell.

26. A network element in a telecommunications system for sending communications to a station associated with a current cell network element being associated with a cell, said network element being arranged to send information to said station, wherein said information comprises information defining a threshold, wherein said station is arranged to modify measurements of the received strength of communications from at least one other cell if the measurements exceed said threshold.

27. A network element as claimed in claim 25 or 26, wherein said network element is associated with the current cell.

28. A network element as claimed in claim 25 or 26 wherein said network element is associated with said at least one other cell.

29. A method for changing at least one current cell, in a cellular telecommunications network, with which a station is associated, said method comprising the steps of:

measuring at the station the strength of a communication from said at least one current cell;

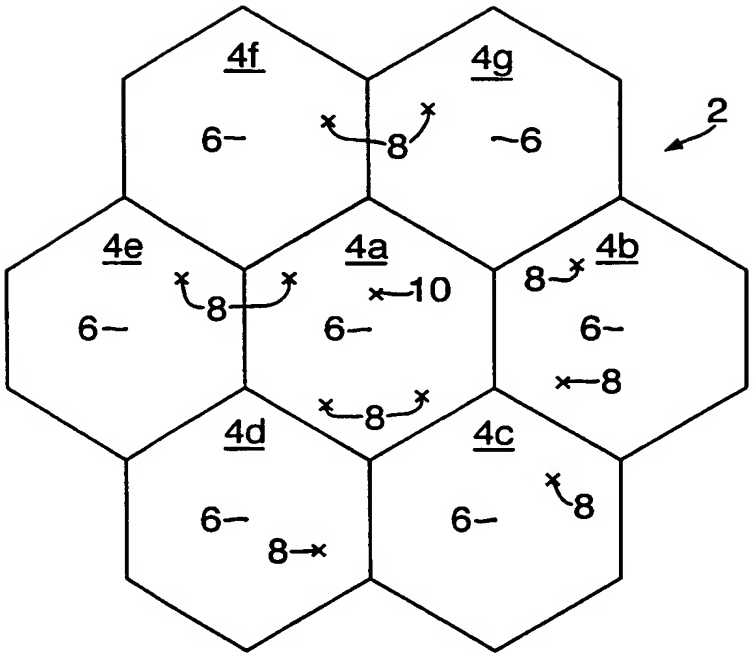
measuring at the station the strength of a communication from at least one other cell;

modifying the result of the measuring step in which the strength of the communication from at least one other cell and/or the at least one current cell is measured to take into account a condition of said at least one current and/or said at least one other cell if the measured strength of the communication from the current cell and/or the measured strength of the communication from the at least one other cell satisfy a predetermined condition;

if the modifying step is performed, comparing the measured strength of the communication from at least one current cell and the measured strength of a communication from the at least one other cell, at least one of said measured strengths being modified in the modifying step; and

depending of the results of the comparison, changing the at least one current cell with which the station is associated.

Fig.1.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8
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4d
4c
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8
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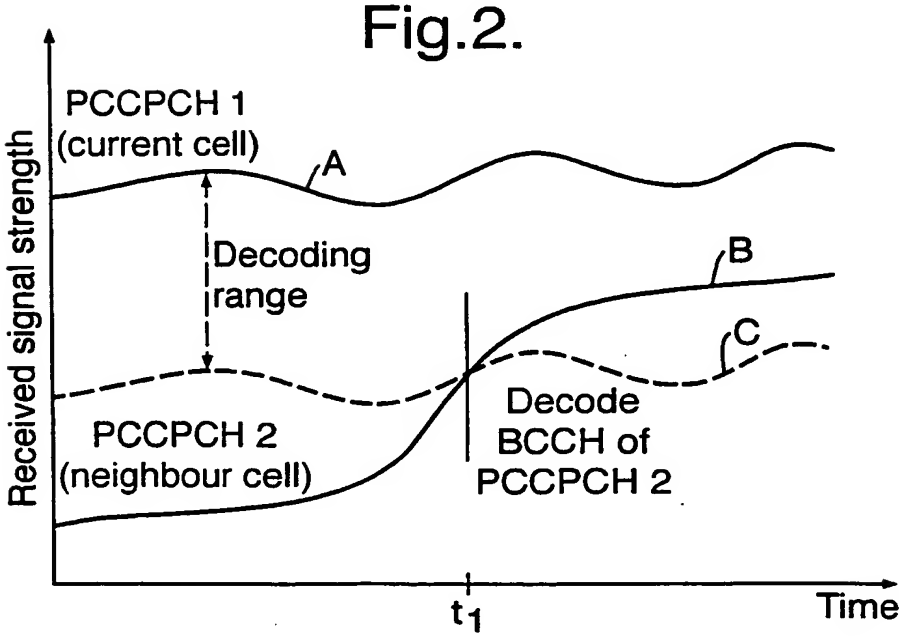
8

Fig.2.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Decoding
range
B
C
Received signal strength
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(neighbour cell)
Decode
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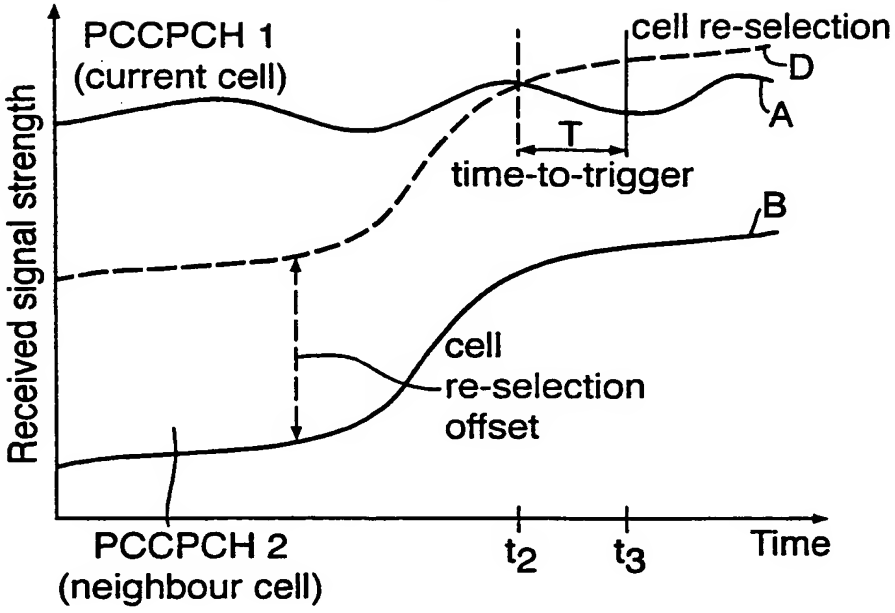
t1
Time

Fig.3.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cell re-selection
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A
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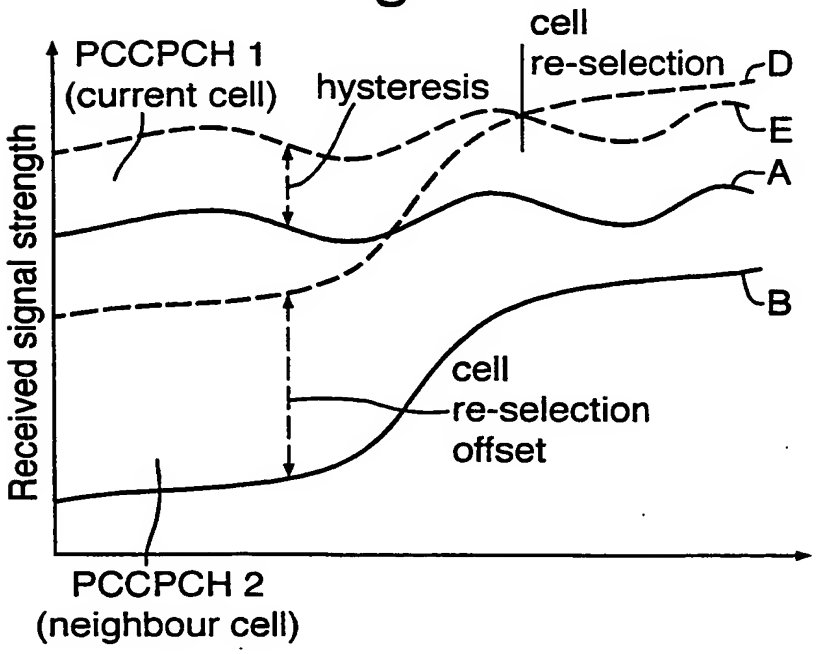
t2
t3
Time

Fig.4.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A
B
Received signal strength
cell
re-selection
offset
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(neighbour cell)

INTERNATIONAL SEARCH REPORT

Application No
PCT/EP 00/06645

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 H04Q7/38

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 H04Q

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)
EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5 241 686 A (CHARBONNIER ALAIN) 31 August 1993 (1993-08-31) column 2, line 26 -column 3, line 22 column 4, line 51 -column 5, line 3 column 6, line 36 -column 12, line 10 claims 1-10 ---	1-3,7,8, 12, 14-16, 18,22, 25,27-29
X	US 5 640 677 A (KARLSSON BROR ANGSTROM KE) 17 June 1997 (1997-06-17) column 9, line 34 -column 10, line 15 column 10, line 63 -column 12, line 39 --- -/--	1,2,4,6, 7,12-16, 18,20, 22,25-29

[X] Further documents are listed in the continuation of box C.

[X] Patent family members are listed in annex.

° Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

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"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
31 August 2000	06/09/2000

Name and mailing address of the ISA	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Pecci, R

Form PCT/ISA/210 (second sheet) (July 1992)

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication,where appropriate, of the relevant passages	Relevant to claim No.
X	WO 98 27776 A (SATARASINGHE PRASANNA J ;NORTHERN TELECOM LTD (CA)) 25 June 1998 (1998-06-25) page 6, line 18 -page 7, line 2	1,2, 15-19, 22,29

INTERNATIONAL SEARCH REPORT

Information on patent family members

Application No
PCT/EP 00/06645

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 5241686 A	31-08-1993	FR 2664768 A	17-01-1992
		DE 69114389 D	14-12-1995
		DE 69114389 T	05-06-1996
		EP 0466543 A	15-01-1992
		JP 2903787 B	14-06-1999
		JP 4233832 A	21-08-1992
US 5640677 A	17-06-1997	US 5499386 A	12-03-1996
		AU 690566 B	30-04-1998
		AU 7197094 A	06-02-1995
		BR 9405506 A	08-09-1999
		CN 1111929 A	15-11-1995
		EP 0659327 A	28-06-1995
		FI 951079 A	08-03-1995
		JP 8501430 T	13-02-1996
		MX 9405098 A	31-01-1995
		NO 950874 A	08-05-1995
		RU 2113772 C	20-06-1998
		WO 9502309 A	19-01-1995
		SG 46241 A	20-02-1998
		ZA 9404607 A	17-02-1995
WO 9827776 A	25-06-1998	US 6026301 A	15-02-2000
		AU 5131298 A	15-07-1998

PATENT COOPERATION TREATY

From the INTERNATIONAL BUREAU

PCT

To:

STYLE, Kelda, Camilla, Karen
Page White & Farrer
54 Doughty Street
London WC1N 2LS
ROYAUME-UNI

RECEIVED
22 JAN 2001
Ans'd.....

NOTIFICATION OF THE RECORDING OF A CHANGE

(PCT Rule 92bis.1 and Administrative Instructions, Section 422)

Date of mailing (day/month/year) 16 January 2001 (16.01.01)	
Applicant's or agent's file reference 102407/KCS/JCB	**IMPORTANT NOTIFICATION**
International application No. PCT/EP00/06645	**International filing date** (day/month/year) 12 July 2000 (12.07.00)

1. The following indications appeared on record concerning:

[X] the applicant [X] the inventor [ ] the agent [ ] the common representative

Name and Address	State of Nationality	State of Residence
JANSEN, Kaj Ristikedonkatu 34 as 4 FIN-24240 Salo Finland	FI	FI
	Telephone No.	
	Facsimile No.	
	Teleprinter No.	

2. The International Bureau hereby notifies the applicant that the following change has been recorded concerning:

[ ] the person [ ] the name [X] the address [ ] the nationality [ ] the residence

Name and Address	State of Nationality	State of Residence
JANSEN, Kaj Salaistentie 36 FIN-24240 Salo Finland	FI	FI
	Telephone No.	
	Facsimile No.	
	Teleprinter No.	

3. Further observations, if necessary:

4. A copy of this notification has been sent to:

[X] the receiving Office
[ ] the International Searching Authority
[ ] the International Preliminary Examining Authority
[X] the designated Offices concerned
[ ] the elected Offices concerned
[ ] other:

The International Bureau of WIPO **34, chemin des Colombettes** **1211 Geneva 20, Switzerland**	Authorized officer Catherine Massetti
Facsimile No.: (41-22) 740.14.35	Telephone No.: (41-22) 338.83.38

Form PCT/IB/306 (March 1994)

003774545

PATENT COOPERATION TREATY

From the INTERNATIONAL BUREAU

PCT

To:

STYLE, Kelda, Camilla, Karen
Page White & Farrer
54 Doughty Street
London WC1N 2LS
ROYAUME-UNI

NOTIFICATION OF THE RECORDING OF A CHANGE

(PCT Rule 92bis.1 and Administrative Instructions, Section 422)

Date of mailing (day/month/year)
16 January 2001 (16.01.01)

Applicant's or agent's file reference
102407/KCS/JCB

IMPORTANT NOTIFICATION

International application No.
PCT/EP00/06645

International filing date (day/month/year)
12 July 2000 (12.07.00)

1. The following indications appeared on record concerning:

[X] the applicant [X] the inventor [ ] the agent [ ] the common representative

Name and Address
KORPELA, Sari, K.
Forsellesintic 57 E 38
FIN-02700 Kaunlainen
Finland

State of Nationality: FI
State of Residence: FI
Telephone No.:
Facsimile No.:
Teleprinter No.:

2. The International Bureau hereby notifies the applicant that the following change has been recorded concerning:

[ ] the person [ ] the name [X] the address [ ] the nationality [ ] the residence

Name and Address
KORPELA, Sari, K.
Bredankuja 7 G 25
FIN-02700 Kaunlainen
Finland

State of Nationality: FI
State of Residence: FI
Telephone No.:
Facsimile No.:
Teleprinter No.:

3. Further observations, if necessary:

4. A copy of this notification has been sent to:

[X] the receiving Office
[ ] the International Searching Authority
[ ] the International Preliminary Examining Authority
[X] the designated Offices concerned
[ ] the elected Offices concerned
[ ] other:

The International Bureau of WIPO
34, chemin des Colombettes
1211 Geneva 20, Switzerland
Facsimile No.: (41-22) 740.14.35

Authorized officer
Catherine Massetti
Telephone No.: (41-22) 338.83.38

WO 01/05182
PCT/EP00/06645

PATENT COOPERATION TREATY

From the INTERNATIONAL BUREAU

PCT

NOTICE INFORMING THE APPLICANT OF THE COMMUNICATION OF THE INTERNATIONAL APPLICATION TO THE DESIGNATED OFFICES

(PCT Rule 47.1(c), first sentence)

To:
STYLE, Kelda, Camilla, Karen
Page White & Farrer
54 Doughty Street
London WC1N 2LS
ROYAUME-UNI

Date of mailing (day/month/year) 18 January 2001 (18.01.01)	
Applicant's or agent's file reference 102407/KCS/JCB	**IMPORTANT NOTICE**

International application No.	**International filing date** (day/month/year)	**Priority date** (day/month/year)
PCT/EP00/06645	12 July 2000 (12.07.00)	14 July 1999 (14.07.99)

Applicant
NOKIA NETWORKS OY et al

1. Notice is hereby given that the International Bureau has communicated, as provided in Article 20, the international application to the following designated Offices on the date indicated above as the date of mailing of this Notice:
   AG,AU,BZ,DZ,KP,KR,MZ,US

   In accordance with Rule 47.1(c), third sentence, those Offices will accept the present Notice as conclusive evidence that the communication of the international application has duly taken place on the date of mailing indicated above and no copy of the international application is required to be furnished by the applicant to the designated Office(s).

2. The following designated Offices have waived the requirement for such a communication at this time:
   AE,AL,AM,AP,AT,AZ,BA,BB,BG,BR,BY,CA,CH,CN,CR,CU,CZ,DE,DK,DM,EA,EE,EP,ES,FI,GB,GD,
   GE,GH,GM,HR,HU,ID,IL,IN,IS,JP,KE,KG,KZ,LC,LK,LR,LS,LT,LU,LV,MA,MD,MG,MK,MN,MW,MX,
   NO,NZ,OA,PL,PT,RO,RU,SD,SE,SG,SI,SK,SL,TJ,TM,TR,TT,TZ,UA,UG,UZ,VN,YU,ZA,ZW
   The communication will be made to those Offices only upon their request. Furthermore, those Offices do not require the applicant to furnish a copy of the international application (Rule 49.1(a-bis)).

3. Enclosed with this Notice is a copy of the international application as published by the International Bureau on
   18 January 2001 (18.01.01) under No. WO 01/05182

REMINDER REGARDING CHAPTER II (Article 31(2)(a) and Rule 54.2)

If the applicant wishes to postpone entry into the national phase until 30 months (or later in some Offices) from the priority date, a **demand for international preliminary examination** must be filed with the competent International Preliminary Examining Authority before the expiration of 19 months from the priority date.

It is the applicant's sole responsibility to monitor the 19-month time limit.

Note that only an applicant who is a national or resident of a PCT Contracting State which is bound by Chapter II has the right to file a demand for international preliminary examination.

REMINDER REGARDING ENTRY INTO THE NATIONAL PHASE (Article 22 or 39(1))

If the applicant wishes to proceed with the international application in the **national phase**, he must, within 20 months or 30 months, or later in some Offices, perform the acts referred to therein before each designated or elected Office.

For further important information on the time limits and acts to be performed for entering the national phase, see the Annex to Form PCT/IB/301 (Notification of Receipt of Record Copy) and Volume II of the PCT Applicant's Guide.

The International Bureau of WIPO
34, chemin des Colombettes
1211 Geneva 20, Switzerland

Facsimile No. (41-22) 740.14.35

Authorized officer
J. Zahra

Telephone No. (41-22) 338.83.38

The demand must be filed directly with the competent International Preliminary Examining Authority or, if two or more Authorities are competent, with the one chosen by the applicant. The full name or two-letter code of that Authority may be indicated by the applicant on the line below:

IPEA/ _____

PCT

CHAPTER II

DEMAND

under Article 31 of the Patent Cooperation Treaty:
The undersigned requests that the international application specified below be the subject of international preliminary examination according to the Patent Cooperation Treaty and hereby elects all eligible States (except where otherwise indicated).

For International Preliminary Examining Authority use only

Identification of IPEA	Date of receipt of DEMAND

Box No. I IDENTIFICATION OF THE INTERNATIONAL APPLICATION

Applicant's or agent's file reference: 102407/KCS/JCB

International application No.	International filing date *(day/month/year)*	(Earliest) Priority date *(day/month/year)*
PCT/EP00/06645	12 July 2000	14 July 1999

Title of invention: A METHOD OF SELECTING A NEW CELL

Box No. II APPLICANT(S)

Name and address: *(Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)*
NOKIA NETWORKS OY
Keilalahdentie 4
02150 Espoo
Finland

Telephone No.:

Facsimile No.:

Teleprinter No.:

State *(that is, country)* of nationality: FI

State *(that is, country)* of residence: FI

Name and address: *(Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)*
SALONAHO, Oscar
Oksasenkatu 4 bA 8
00100 Helsinki
Finland

State *(that is, country)* of nationality: FI

State *(that is, country)* of residence: FI

Name and address: *(Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)*
IISAKKILA, Kaisu
Lantinen Papinkatu 6 A 4
00530 Helsinki
Finland

State *(that is, country)* of nationality: FI

State *(that is, country)* of residence: FI

[X] Further applicants are indicated on a continuation sheet.

International application No.
PCT/EP00/06645

Continuation of Box No. II APPLICANT(S)

If none of the following sub-boxes is used, this sheet should not be included in the demand.

Name and address: *(Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)*

KORPELA, Sari K
Bredankuja 7 G 25
FIN-02700 Kauniainen

State *(that is, country)* of nationality:	State *(that is, country)* of residence:
FI	FI

Name and address: *(Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)*

JANSEN, Kaj
Salaistentie 36
FIN-24240 Salo

State *(that is, country)* of nationality:	State *(that is, country)* of residence:
FI	FI

Name and address: *(Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)*

State *(that is, country)* of nationality:	State *(that is, country)* of residence:

Name and address: *(Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)*

State *(that is, country)* of nationality:	State *(that is, country)* of residence:

☐ Further applicants are indicated on another continuation sheet.

International application No. PCT/EP00/06645

Box No. III AGENT OR COMMON REPRESENTATIVE; OR ADDRESS FOR CORRESPONDENCE

The following person is [X] agent [ ] common representative

and [X] has been appointed earlier and represents the applicant(s) also for international preliminary examination.

[ ] is hereby appointed and any earlier appointment of (an) agent(s)/common representative is hereby revoked.

[ ] is hereby appointed, specifically for the procedure before the International Preliminary Examining Authority, in addition to the agent(s)/common representative appointed earlier.

Name and address: *(Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)*

BOAKES; Jason Carrington
PAGE WHITE & FARRER
54 Doughty Street
London WC1N 2LS
UNITED KINGDOM

Telephone No.: 020 7831 7929

Facsimile No.: 020 7831 8040

Teleprinter No.:

[ ] **Address for correspondence:** Mark this check-box where no agent or common representative is/has been appointed and the space above is used instead to indicate a special addr ess to which correspondence should be sent.

Box No. IV BASIS FOR INTERNATIONAL PRELIMINARY EXAMINATION

Statement concerning amendments:*

1. The applicant wishes the international preliminary examination **to start on the basis of:**

[X] the international application as originally filed

the description [X] as originally filed
[ ] as amended under Article 34

the claims [X] as originally filed
[ ] as amended under Article 19 (together with any accompanying statement)
[ ] as amended under Article 34

the drawings [X] as originally filed
[ ] as amended under Article 34

2. [ ] The applicant wishes any amendment to the claims under Article 19 to be considered as reversed.

3. [ ] The applicant wishes the start of the international preliminary examination **to be postponed** until the expiration of 20 months from the priority date unless the International Preliminary Examining Authority receives a copy of any amendments made under Article 19 or a notice from the applicant that he does not wish to make such amendments (Rule 69.1(d)). *(This check-box may be marked only where the time limit under Article 19 has not yet expired.)*

* Where no check-box is marked, international preliminary examination will start on the basis of the international application as originally filed or, where a copy of amendments to the claims under Article 19 and/or amendments of the international application under Article 34 are received by the International Preliminary Examining Authority before it has begun to draw up a written opinion or the international preliminary examination report, as so amended.

Language for the purposes of international preliminary examination: ENGLISH

[X] which is the language in which the international application was filed.
[ ] which is the language of a translation furnished for the purposes of international search.
[ ] which is the language of publication of the international application.
[ ] which is the language of the translation (to be) furnished for the purposes of international preliminary examination.

Box No. V ELECTION OF STATES

The applicant hereby **elects all eligible States** *(that is, all States which have been designated and which are bound by Chapter II of the PCT)*

excluding the following States which the applicant wishes **not to elect:**

International application No. PCT/EP00/06645

Box No. VI CHECK LIST

The demand is accompanied by the following elements, in the language referred to in Box No. IV, for the purposes of international preliminary examination:

			For International Preliminary Examining Authority use only: received	not received
1. translation of international application	:	sheets	☐	☐
2. amendments under Article 34	:	sheets	☐	☐
3. copy (or, where required, translation) of amendments under Article 19	:	sheets	☐	☐
4. copy (or, where required, translation) of statement under Article 19	:	sheets	☐	☐
5. letter	:	sheets	☐	☐
6. other *(specify)*	:	sheets	☐	☐

The demand is also accompanied by the item(s) marked below:

1. ☐ fee calculation sheet
2. ☐ separate signed power of attorney
3. ☐ copy of general power of attorney; reference number, if any:
4. ☐ statement explaining lack of signature
5. ☐ nucleotide and or amino acid sequence listing in computer readable form
6. ☐ other *(specify)*:

Box No. VII SIGNATURE OF APPLICANT, AGENT OR COMMON REPRESENTATIVE

Next to each signature, indicate the name of the person signing and the capacity in which the person signs (if such capacity is not obvious from reading the demand).

BOAKES; Jason Carrington

For International Preliminary Examining Authority use only

1. Date of actual receipt of DEMAND:
2. Adjusted date of receipt of demand due to CORRECTIONS under Rule 60.1(b):
3. ☐ The date of receipt of the demand is AFTER the expiration of 19 months from the priority date and item 4 or 5, below, does not apply. ☐ The applicant has been informed accordingly.
4. ☐ The date of receipt of the demand is WITHIN the period of 19 months from the priority date as extended by virtue of Rule 80.5.
5. ☐ Although the date of receipt of the demand is after the expiration of 19 months from the priority date, the delay in arrival is EXCUSED pursuant to Rule 82.

For International Bureau use only

Demand received from IPEA on:

See Notes to the demand form

PCT

REQUEST

The undersigned requests that the present international application be processed according to the Patent Cooperation Treaty.

For receiving Office use only

International Application No. PCT/EP 00 / 06645

International Filing Date 12 JUL 2000 (12.07.2000)

Name of receiving Office and "PCT International Application": EUROPEAN PATENT OFFICE PCT INTERNATIONAL APPLICATION

Applicant's or agent's file reference *(if desired) (12 characters maximum)*: 102407/KCS/JCB

Box No. I TITLE OF INVENTION

A METHOD OF SELECTING A NEW CELL

Box No. II APPLICANT

Name and address: *(Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)*

NOKIA NETWORKS OY
Keilalahdentie 4
02150 Espoo
Finland

☐ This person is also inventor.

Telephone No.

Facsimile No.

Teleprinter No.

State *(that is, country)* of nationality: FI

State *(that is, country)* of residence: FI

This person is applicant for the purposes of: ☐ all designated States ☒ all designated States except the United States of America ☐ the United States of America only ☐ the States indicated in the Supplemental Box

Box No. III FURTHER APPLICANT(S) AND/OR (FURTHER) INVENTOR(S)

Name and address: *(Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)*

SALONAHO, Oscar
Oksasenkatu 4 bA 8
00100 Helsinki
Finland

This person is:

☐ applicant only

☒ applicant and inventor

☐ inventor only *(If this check-box is marked, do not fill in below.)*

State *(that is, country)* of nationality: FI

State *(that is, country)* of residence: FI

This person is applicant for the purposes of: ☐ all designated States ☐ all designated States except the United States of America ☒ the United States of America only ☐ the States indicated in the Supplemental Box

☒ Further applicants and/or (further) inventors are indicated on a continuation sheet.

RO/EP

Box No. IV AGENT OR COMMON REPRESENTATIVE; OR ADDRESS FOR CORRESPONDENCE

The person identified below is hereby/has been appointed to act on behalf of the applicant(s) before the competent International Authorities as: ☒ agent ☐ common representative

Name and address: *(Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)*

STYLE, Kelda Camilla Karen
Page White & Farrer
54 Doughty Street
London WC1N 2LS
United Kingdom

Telephone No. 020 7831 7929

Facsimile No. 020 7831 8040

Teleprinter No. 8955681

☐ **Address for correspondence:** Mark this check-box where no agent or common representative is/has been appointed and the space above is used instead to indicate a special address to which correspondence should be sent.

Continuation of Box No. III FURTHER APPLICANT(S) AND/OR (FURTHER) INVENTOR(S)

If none of the following sub-boxes is used, this sheet should not be included in the request.

Name and address: *(Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)*

IISAKKILA, Kaisu
Läntinen Papinkatu 6 A 4
00530 Helsinki
Finland

This person is:
- [ ] applicant only
- [x] applicant and inventor
- [ ] inventor only *(If this check-box is marked, do not fill in below.)*

State *(that is, country)* of nationality: FI

State *(that is, country)* of residence: FI

This person is applicant for the purposes of:
- [ ] all designated States
- [ ] all designated States except the United States of America
- [x] the United States of America only
- [ ] the States indicated in the Supplemental Box

Name and address: *(Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)*

KORPELA, Sari K
Forsellesintic 57 E 38
02700 Kaunlainen
Finland

This person is:
- [ ] applicant only
- [x] applicant and inventor
- [ ] inventor only *(If this check-box is marked, do not fill in below.)*

State *(that is, country)* of nationality: FI

State *(that is, country)* of residence: FI

This person is applicant for the purposes of:
- [ ] all designated States
- [ ] all designated States except the United States of America
- [x] the United States of America only
- [ ] the States indicated in the Supplemental Box

Name and address: *(Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)*

JANSEN, Kaj
Ristinkedonkatu 34 as 4
24240 Salo
Finland

This person is:
- [ ] applicant only
- [x] applicant and inventor
- [ ] inventor only *(If this check-box is marked, do not fill in below.)*

State *(that is, country)* of nationality: FI

State *(that is, country)* of residence: FI

This person is applicant for the purposes of:
- [ ] all designated States
- [ ] all designated States except the United States of America
- [x] the United States of America only
- [ ] the States indicated in the Supplemental Box

Name and address: *(Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)*

This person is:
- [ ] applicant only
- [ ] applicant and inventor
- [ ] inventor only *(If this check-box is marked, do not fill in below.)*

State *(that is, country)* of nationality:

State *(that is, country)* of residence:

This person is applicant for the purposes of:
- [ ] all designated States
- [ ] all designated States except the United States of America
- [ ] the United States of America only
- [ ] the States indicated in the Supplemental Box

- [ ] Further applicants and/or (further) inventors are indicated on another continuation sheet.

Box No.V DESIGNATION OF STATES

The following designations are hereby made under Rule 4.9(a) *(mark the applicable check-boxes; at least one must be marked)*:

Regional Patent

☒ **AP** **ARIPO Patent:** **GH** Ghana, **GM** Gambia, **KE** Kenya, **LS** Lesotho, **MW** Malawi, **SD** Sudan, **SL** Sierra Leone, **SZ** Swaziland, **TZ** United Republic of Tanzania, **UG** Uganda, **ZW** Zimbabwe, and any other State which is a Contracting State of the Harare Protocol and of the PCT

☒ **EA** **Eurasian Patent:** **AM** Armenia, **AZ** Azerbaijan, **BY** Belarus, **KG** Kyrgyzstan, **KZ** Kazakhstan, **MD** Republic of Moldova, **RU** Russian Federation, **TJ** Tajikistan, **TM** Turkmenistan, and any other State which is a Contracting State of the Eurasian Patent Convention and of the PCT

☒ **EP** **European Patent:** **AT** Austria, **BE** Belgium, **CH and LI** Switzerland and Liechtenstein, **CY** Cyprus, **DE** Germany, **DK** Denmark, **ES** Spain, **FI** Finland, **FR** France, **GB** United Kingdom, **GR** Greece, **IE** Ireland, **IT** Italy, **LU** Luxembourg, **MC** Monaco, **NL** Netherlands, **PT** Portugal, **SE** Sweden, and any other State which is a Contracting State of the European Patent Convention and of the PCT

☒ **OA** **OAPI Patent:** **BF** Burkina Faso, **BJ** Benin, **CF** Central African Republic, **CG** Congo, **CI** Côte d'Ivoire, **CM** Cameroon, **GA** Gabon, **GN** Guinea, **GW** Guinea-Bissau, **ML** Mali, **MR** Mauritania, **NE** Niger, **SN** Senegal, **TD** Chad, **TG** Togo, and any other State which is a member State of OAPI and a Contracting State of the PCT *(if other kind of protection or treatment desired, specify on dotted line)* .....

National Patent *(if other kind of protection or treatment desired, specify on dotted line)*:

☒ **AE** United Arab Emirates
☒ **AL** Albania
☒ **AM** Armenia
☒ **AT** Austria
☒ **AU** Australia
☒ **AZ** Azerbaijan
☒ **BA** Bosnia and Herzegovina
☒ **BB** Barbados
☒ **BG** Bulgaria
☒ **BR** Brazil
☒ **BY** Belarus
☒ **CA** Canada
☒ **CH and LI** Switzerland and Liechtenstein
☒ **CN** China
☒ **CR** Costa Rica
☒ **CU** Cuba
☒ **CZ** Czech Republic
☒ **DE** Germany
☒ **DK** Denmark
☒ **DM** Dominica
☒ **EE** Estonia
☒ **ES** Spain
☒ **FI** Finland
☒ **GB** United Kingdom
☒ **GD** Grenada
☒ **GE** Georgia
☒ **GH** Ghana
☒ **GM** Gambia
☒ **HR** Croatia
☒ **HU** Hungary
☒ **ID** Indonesia
☒ **IL** Israel
☒ **IN** India
☒ **IS** Iceland
☒ **JP** Japan
☒ **KE** Kenya
☒ **KG** Kyrgyzstan
☒ **KP** Democratic People's Republic of Korea
☒ **KR** Republic of Korea
☒ **KZ** Kazakhstan
☒ **LC** Saint Lucia
☒ **LK** Sri Lanka
☒ **LR** Liberia
☒ **LS** Lesotho
☒ **LT** Lithuania
☒ **LU** Luxembourg
☒ **LV** Latvia
☒ **MA** Morocco
☒ **MD** Republic of Moldova
☒ **MG** Madagascar
☒ **MK** The former Yugoslav Republic of Macedonia
☒ **MN** Mongolia
☒ **MW** Malawi
☒ **MX** Mexico
☒ **NO** Norway
☒ **NZ** New Zealand
☒ **PL** Poland
☒ **PT** Portugal
☒ **RO** Romania
☒ **RU** Russian Federation
☒ **SD** Sudan
☒ **SE** Sweden
☒ **SG** Singapore
☒ **SI** Slovenia
☒ **SK** Slovakia
☒ **SL** Sierra Leone
☒ **TJ** Tajikistan
☒ **TM** Turkmenistan
☒ **TR** Turkey
☒ **TT** Trinidad and Tobago
☒ **TZ** United Republic of Tanzania
☒ **UA** Ukraine
☒ **UG** Uganda
☒ **US** United States of America
☒ **UZ** Uzbekistan
☒ **VN** Viet Nam
☒ **YU** Yugoslavia
☒ **ZA** South Africa
☒ **ZW** Zimbabwe

Check-boxes reserved for designating States which have become party to the PCT after issuance of this sheet:

☒ People's Democratic Republic of Algeria
☒ Antigua & Barbuda
☒ Republic of Mozambique [x] Belize

Precautionary Designation Statement: In addition to the designations made above, the applicant also makes under Rule 4.9(b) all other designations which would be permitted under the PCT except any designation(s) indicated in the Supplemental Box as being excluded from the scope of this statement. The applicant declares that those additional designations are subject to confirmation and that any designation which is not confirmed before the expiration of 15 months from the priority date is to be regarded as withdrawn by the applicant at the expiration of that time limit. *(Confirmation (including fees) must reach the receiving Office within the 15-month time limit.)*

Supplemental Box *If the Supplemental Box is not used, this sheet should not be included in the request.*

*1. If, in any of the Boxes, **the space is insufficient** to furnish all the information: in such case, write "Continuation of Box No. ..." [indicate the number of the Box] and furnish the information in the same manner as required according to the captions of the Box in which the space was insufficient, in particular:*

*(i) **if more than two persons are involved as applicants and/or inventors** and no "continuation sheet" is available: in such case, write "Continuation of Box No. III" and indicate for each additional person the same type of information as required in Box No. III. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below;*

*(ii) if, in Box No. II or in any of the sub-boxes of Box No. III, the indication **"the States indicated in the Supplemental Box"** is checked: in such case, write "Continuation of Box No. II" or "Continuation of Box No. III" or "Continuation of Boxes No. II and No. III" (as the case may be), indicate the name of the applicant(s) involved and, next to (each) such name, the State(s) (and/or, where applicable, ARIPO, Eurasian, European or OAPI patent) for the purposes of which the named person is applicant;*

*(iii) if, in Box No. II or in any of the sub-boxes of Box No. III, **the inventor or the inventor/applicant is not inventor for the purposes of all designated States or for the purposes of the United States of America**: in such case, write "Continuation of Box No. II" or "Continuation of Box No. III" or "Continuation of Boxes No. II and No. III" (as the case may be), indicate the name of the inventor(s) and, next to (each) such name, the State(s) (and/or, where applicable, ARIPO, Eurasian, European or OAPI patent) for the purposes of which the named person is inventor;*

*(iv) if, in addition to the agent(s) indicated in Box No. IV, there are **further agents**: in such case, write "Continuation of Box No. IV" and indicate for each further agent the same type of information as required in Box No. IV;*

*(v) if, in Box No. V, the name of any State (or OAPI) is accompanied by the indication "**patent of addition**," or "**certificate of addition**," or if, in Box No. V, the name of the United States of America is accompanied by an indication "**continuation**" or "**continuation-in-part**": in such case, write "Continuation of Box No. V" and the name of each State involved (or OAPI), and after the name of each such State (or OAPI), the number of the parent title or parent application and the date of grant of the parent title or filing of the parent application;*

*(vi) if, in Box No. VI, there are **more than three earlier applications whose priority is claimed**: in such case, write "Continuation of Box No. VI" and indicate for each additional earlier application the same type of information as required in Box No. VI;*

*(vii) if, in Box No. VI, **the earlier application is an ARIPO application**: in such case, write "Continuation of Box No. VI", specify the number of the item corresponding to that earlier application and indicate at least one country party to the Paris Convention for the Protection of Industrial Property or one Member of the World Trade Organization for which that earlier application was filed.*

*2. If, with regard to the **precautionary designation statement** contained in Box No. V, the applicant wishes to exclude any State(s) from the scope of that statement: in such case, write "Designation(s) excluded from precautionary designation statement" and indicate the name or two-letter code of each State so excluded.*

*3. If the applicant claims, in respect of any designated Office, the benefits of provisions of the national law concerning **non-prejudicial disclosures or exceptions to lack of novelty**: in such case, write "Statement concerning non-prejudicial disclosures or exceptions to lack of novelty" and furnish that statement below.*

Continuation of Box No VI

PALMER, ROGER (GB)
RICHARDS, DAVID JOHN (GB)
PENDLEBURY, ANTHONY (GB)
DRIVER, VIRGINIA ROZANNE (GB)
JENKINS, PETER DAVID (GB)
DANIELS, JEFFREY NICHOLAS (GB)
NEOBARD, WILLIAM JOHN (GB)
SHACKLETON, NICOLA (GB)
SLINGSBY, PHILIP (GB)
HILL, CHRISTOPHER MICHAEL (GB)
RUUSKANEN, JUHA-PEKKA (FI)
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FACSIMILE: 0171 831 8040
TELEX: 8955681

PCT/EP 00 / 06645

Box No. VI PRIORITY CLAIM ☐ Further priority claims are indicated in the Supplemental Box.

Filing date of earlier application (day/month/year)	Number of earlier application	Where earlier application is: national application: country	regional application:* regional Office	international application: receiving Office
item (1) 14 JUL 1999 (14.07.1999)	9916565.6	GB		
item (2)				
item (3)				

☐ The receiving Office is requested to prepare and transmit to the International Bureau a certified copy of the earlier application(s) *(only if the earlier application was filed with the Office which for the purposes of the present international application is the receiving Office)* identified above as item(s): _____

* *Where the earlier application is an ARIPO application, it is mandatory to indicate in the Supplemental Box at least one country party to the Paris Convention for the Protection of Industrial Property for which that earlier application was filed (Rule 4.10(b)(ii)). See Supplemental Box.*

Box No. VII INTERNATIONAL SEARCHING AUTHORITY

Choice of International Searching Authority (ISA) *(if two or more International Searching Authorities are competent to carry out the international search, indicate the Authority chosen; the two-letter code may be used)* : ISA /

Request to use results of earlier search; reference to that search *(if an earlier search has been carried out by or requested from the International Searching Authority)*:

Date *(day/month/year)* Number Country *(or regional Office)*

Box No. VIII CHECK LIST; LANGUAGE OF FILING English

This international application contains the following **number of sheets**:

request	:	5
description (excluding sequence listing part)	:	13
claims	:	5
abstract	:	1
drawings	:	2
sequence listing part of description	:	
Total number of sheets	:	26

This international application is **accompanied by** the item(s) marked below:

1. ☒ fee calculation sheet
2. ☐ separate signed power of attorney
3. ☐ copy of general power of attorney; reference number, if any:
4. ☐ statement explaining lack of signature
5. ☐ priority document(s) identified in Box No. VI as item(s):
6. ☐ translation of international application into (language):
7. ☐ separate indications concerning deposited microorganism or other biological material
8. ☐ nucleotide and/or amino acid sequence listing in computer readable form
9. ☐ other *(specify)*:

Figure of the drawings which should accompany the abstract: 2

Language of filing of the international application: English

Box No. IX SIGNATURE OF APPLICANT OR AGENT

Next to each signature, indicate the name of the person signing and the capacity in which the person signs (if such capacity is not obvious from reading the request).

SLINGSBY, Philip Roy
Authorised Representative

For receiving Office use only

1. Date of actual receipt of the purported international application: (12.07.00) 12 JUL 2000
2. Drawings: ☒ received: ☐ not received:
3. Corrected date of actual receipt due to later but timely received papers or drawings completing the purported international application:
4. Date of timely receipt of the required corrections under PCT Article 11(2):
5. International Searching Authority (if two or more are competent): ISA /
6. ☐ Transmittal of search copy delayed until search fee is paid.

For International Bureau use only

Date of receipt of the record copy by the International Bureau:

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference	FOR FURTHER ACTION	see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.
102407/KCS/JCB		
International application No.	International filing date *(day/month/year)*	(Earliest) Priority Date *(day/month/year)*
PCT/EP 00/ 06645	12/07/2000	14/07/1999
Applicant		
NOKIA NETWORKS OY		

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 3 sheets.

[X] It is also accompanied by a copy of each prior art document cited in this report.

1. **Basis of the report**

   a. With regard to the **language**, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

   [ ] the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

   b. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international search was carried out on the basis of the sequence listing :

   [ ] contained in the international application in written form.

   [ ] filed together with the international application in computer readable form.

   [ ] furnished subsequently to this Authority in written form.

   [ ] furnished subsequently to this Authority in computer readble form.

   [ ] the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

   [ ] the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished

2. [ ] **Certain claims were found unsearchable** (See Box I).

3. [ ] **Unity of invention is lacking** (see Box II).

4. With regard to the **title,**

   [X] the text is approved as submitted by the applicant.

   [ ] the text has been established by this Authority to read as follows:

5. With regard to the **abstract,**

   [X] the text is approved as submitted by the applicant.

   [ ] the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the **drawings** to be published with the abstract is Figure No. 2

   [X] as suggested by the applicant.

   [ ] because the applicant failed to suggest a figure.

   [ ] because this figure better characterizes the invention.

   [ ] None of the figures.

INTERNATIONAL SEARCH REPORT

International Application No
PCT/EP 00/06645

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 H04Q7/38

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 H04Q

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)
EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5 241 686 A (CHARBONNIER ALAIN) 31 August 1993 (1993-08-31) column 2, line 26 -column 3, line 22 column 4, line 51 -column 5, line 3 column 6, line 36 -column 12, line 10 claims 1-10 ---	1-3,7,8, 12, 14-16, 18,22, 25,27-29
X	US 5 640 677 A (KARLSSON BROR ANGSTROM KE) 17 June 1997 (1997-06-17) column 9, line 34 -column 10, line 15 column 10, line 63 -column 12, line 39 --- -/--	1,2,4,6, 7,12-16, 18,20, 22,25-29

[X] Further documents are listed in the continuation of box C.

[X] Patent family members are listed in annex.

° Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
31 August 2000	06/09/2000

Name and mailing address of the ISA	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL – 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Pecci, R

Form PCT/ISA/210 (second sheet) (July 1992)

INTERNATIONAL SEARCH REPORT

International Application No
PCT/EP 00/06645

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication,where appropriate, of the relevant passages	Relevant to claim No.
X	WO 98 27776 A (SATARASINGHE PRASANNA J ;NORTHERN TELECOM LTD (CA)) 25 June 1998 (1998-06-25) page 6, line 18 -page 7, line 2	1,2, 15-19, 22,29

Form PCT/ISA/210 (continuation of second sheet) (July 1992)

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No
PCT/EP 00/06645

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 5241686 A	31-08-1993	FR 2664768 A	17-01-1992
		DE 69114389 D	14-12-1995
		DE 69114389 T	05-06-1996
		EP 0466543 A	15-01-1992
		JP 2903787 B	14-06-1999
		JP 4233832 A	21-08-1992
US 5640677 A	17-06-1997	US 5499386 A	12-03-1996
		AU 690566 B	30-04-1998
		AU 7197094 A	06-02-1995
		BR 9405506 A	08-09-1999
		CN 1111929 A	15-11-1995
		EP 0659327 A	28-06-1995
		FI 951079 A	08-03-1995
		JP 8501430 T	13-02-1996
		MX 9405098 A	31-01-1995
		NO 950874 A	08-05-1995
		RU 2113772 C	20-06-1998
		WO 9502309 A	19-01-1995
		SG 46241 A	20-02-1998
		ZA 9404607 A	17-02-1995
WO 9827776 A	25-06-1998	US 6026301 A	15-02-2000
		AU 5131298 A	15-07-1998